

REMARKS

In the present application, claims 1-13 and 15-40 are pending. Claims 1-13 and 15-40 are rejected. As a result of this response, claims 1-13 and 15-40 are believed to be in condition for allowance.

Claim Rejections - 35 USC § 103

The Examiner rejected claims 1-3, 5, 6, 15-29, 32, and 34-40 as being unpatentable over Miyamoto et al. (5,114,224) in view of Connelly et al. (2003/0202156).

Applicants respectfully, yet forcefully, disagree with the Examiner's assertions regarding the teachings of Miyamoto. Specifically, the Examiner asserts that Miyamoto et al. teaches "the unit comprised of at least a projector (11) for projecting a distorted image (since it is designed for projecting on a curved surface it must project at least a slightly distorted image since a non-distorted flat image would not appear correct on a curved surface" and, further, "to produce from the distorted image a substantially undistorted image on a surface (it is obvious that a undistorted image would be produced, in general people do not purposely make highly distorted images when advertising which is what Miyamoto is designed for."

Claim 1 recites:

1. A positioning system comprising,
at least one mount for mounting a projection unit, the projection unit comprised of at least a projector **for projecting a distorted image**; wherein the at least one mount is coupled to a mechanism for providing translational movement and rotational movement for adjusting one of a position and an orientation of the projection unit **to produce from the distorted image a substantially undistorted image on a surface.**
(emphasis added)

Applicants first note that Miyamoto et al. nowhere mentions, teaches, discloses, hints at, discusses, or recites in any manner or form, projecting a distorted image as recited in claim 1. Neither does the Examiner cite any reference in Miyamoto et al. as

disclosing this element of claim 1. Specifically, the Examiner attempts to reason that “since a non-distorted flat image would not appear correct on a curved surface”, the teachings of Miyamoto et al. presumably being indistinguishable from the quest for a correctly appearing image, Miyamoto et al. simply must employ the projection of a distorted image. The Examiner proceeds further to assert that “it is obvious that a [sic] undistorted image would be produced, in general people do not purposely make highly distorted images when advertising which is what Miyamoto is designed for.”

Such an assertion is not only wholly unsupported by Miyamoto et al. but is, alas, most probably incorrect as well. The projection of an image as described by Miyamoto et al. onto a “balloon or the like” (col. 2, line 54) is likely to result in the projection of an image on an object far removed from the projector. While the surface of a large balloon is curved, it is relatively flat over relatively small distances in much the same way that the state of Texas is generally thought of as flat all the while clinging to the gently curving surface of our earth. Therefore, projecting an image according to the teachings of Miyamoto et al. would most likely result in a projected image which is only slightly distorted and therefore well within acceptable viewing parameters. In short, the physics of the embodiments disclosed in Miyamoto et al. veritably obviate the possibility of producing a “highly distorted” image

It is further of note that while Miyamoto et al. goes to considerable lengths to fully describe the infrared tracking algorithm, the operation of the turn table upon which the projector rests, and the placement of the infrared ray radiating member, no mention is ever made of any form of image distortion or of any element or software component utilized to distort any image in any manner. The addition and integration of such required specialized hardware and software with the existing structure of the device of Miyamoto et al. to solve a problem neither contemplated by nor present in the teachings of Miyamoto et al. is not obvious.

In summation, Miyamoto et al. does not, contrary to the Examiner’s assertions, recite or teach projecting a distorted image and producing from the distorted image a substantially undistorted image on a surface as is claimed.

It is therefore evident that neither Miyamoto et al. nor Connelly individually teach

or suggest projecting a distorted image and producing from the distorted image a substantially undistorted image on a surface. As a result, the combination of the two, such a combination neither suggested nor deemed appropriate, likewise fails to teach or recite this element of claim 1. Claim 1 is therefore in condition for allowance.

Independent claim 24 likewise recites, in similar form, the element discussed above with respect to claim 1. As a result, claim 24 is likewise in condition for allowance. As claims 2, 3, 5, 6, 15-23, and 25-29 depend on claims 1 and 24, they are likewise in condition for allowance.

With respect to claim 32, the Examiner asserts that “using the projector to make an undistorted image upon a surface is obvious in light of the projector that does so.” For the reasons discussed above, it is again asserted that neither Miyamoto et al. nor Connelly teach the asserted element. Claim 32 is therefore in condition for allowance.

The Examiner’s entire analysis of claim 34 consists of the observation/assertion, “Part 4 is basically a computer that executes a computer program for positioning a projection unit to provide a substantially undistorted image upon a surface.” While taking no position on the Examiner’s ability to capture the “basic” realm of technology to which the invention is directed, Applicants wish to note that claim 34 is, like most claims, formed of numerous “specific” elements. For example, claim 34 recites “referring to a stored geometric model for the location to produce the substantially undistorted image in accordance with the geometric model”. Neither Connelly nor Miyamoto et al. teach or suggest this element as recited in claim 34. For this reason alone, claim 34 is in condition for allowance.

Claims 35 and 37 both recite projecting a distorted image. For the reasons discussed above, claims 35 and 37 are in condition for allowance. As claims 36 and 38-39 depend upon claims 35 and 37, they are likewise in condition for allowance. Lastly, claim 40 recites “the controller being responsive to stored geometric model”. For the reasons stated above, claim 40 is in condition for allowance.

The Examiner additionally rejected claim 4 as being unpatentable over Miyamoto et al. in view of Connelly et al. as applied to claims 1-3, 5, 6, 15-29, 32, and 34-40 above, and further in view of Machtig (5,278,596). However, as claim 4 is dependent upon claim 1, and as Machtig does not teach or disclose projecting a distorted image and

producing from the distorted image a substantially undistorted image on a surface, claim 4 is in condition for allowance for the reasons recited above.

The Examiner rejected claims 7-13 and 33 as being unpatentable over Miyamoto et al. in view of Connelly et al. as applied to claims 1-3, 5, 6, 15-29, 32, and 34-40 above, and further in view of Pinhanez (6,431,711). The Examiner notes that Miyamoto et al. and Connelly “do not teach that the system is used for user interaction” while asserting that “Pinhanez’s system further includes an interactivity portion allowing interaction between people and a projector.” For the reasons discussed above, claim 1 is in condition for allowance. As all of claims 7-13 depend upon claim 1, claims 7-13 are in condition for allowance.

Claim 33 recites, in part, “positioning the interaction recognition system at a location by referring to the area layout information”. Neither Miyamoto et al. nor Connelly make any reference to an interaction recognition system. Pinhanez recites the use of a camera to provide interactive capability. (col. 12, line 56 – col. 13, line 46). However, there is no teaching or suggestion of positioning the camera in response to any area layout information as is claimed. As a result claim 33 is in condition for allowance.

Lastly, the Examiner rejected claims 30 and 31 as being unpatentable over Miyamoto et al. in view of Connelly et al. as applied to claims 1-3, 5, 6, 15-29, 32, and 34-40 above, and further in view of Raskar (6,793,350). With respect to claim 30, as discussed above, none of the cited art teaches “coordinating the position of the at least one projector with a position of at least another projector” as claimed. The Examiner is in error when asserting that “As shown in figure 4 of raskar multiple projectors can be used in projecting on large curved surfaces and a first projection unit produces a first portion of the distorted image and a second projection unit produces another portion of the distorted image.” In fact, Fig. 4, and the accompanying explanatory text at column 3, lines 22-40, shows and makes reference to a single projector. Likewise, Figs. 3a-3c, while showing two projectors, makes clear in the accompanying text at column 2, lines 38-60, that there is illustrated the same projector twice showing changes in the projector’s elevation, roll, and azimuth.

Claim 31 recites, in part, “adjusting settings of the at least one projector to produce a calibration image that is substantially undistorted upon the target surface.” The

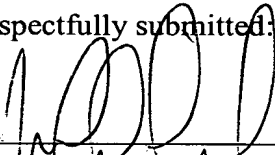
Examiner asserts that “Raskar teaches in figure 1 a method for projecting an undistorted image upon a curved image with more than one projector, which includes projecting a structure light pattern (calibration image as is claimed in applicant’s claim 31).” In fact, Raskar teaches at col. 3, lines 23 -25 (describing Fig. 4) “Typically, the computer application 211 generates 405 a rectangular image 406, having corners generally marked A, B, C, and D.” It is clear from the description, as well as from inspection of Fig. 4, that the calibration image, specifically rectangular image 406, is not distorted but is, rather, a rectangle. Raskar projects an undistorted geometric image of known properties in order to perform calibration of the resulting distorted image as projected upon a surface. In contrast, claim 31 recites producing “a calibration image that is substantially undistorted upon the target surface.” It is therefore clear that Raskar does not teach this element of claim 31. Neither does Miyamoto et al. nor Connelly teach this element. As a result, claims 30 and 31 are in condition for allowance.

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Amdt. Dated October 12, 2005
Reply to Office Action of July 14, 2005

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is submitted that the claims herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

Respectfully submitted:



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12/2/05

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